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<110> MEYERS, Rachel A.
WILLIAMSON, Mark

<120> 47169 and 33935, Novel Human Glycosyl Transferases and Uses Thereof

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<141> 2001-11-20

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Leu Ser Glu Ala Thr Ile Gly Leu His Thr Met Trp Asn Glu His Phe
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Gly Ile Gly Val Val Glu Cys Met Ala Ala Gly Thr Ile Ile Leu Ala
405 410 415

His Asn Ser Gly Gly Pro Lys Leu Asp Ile Val Val Pro His Glu Gly
420 425 430

Asp Ile Thr Gly Phe Leu Ala Glu Ser Glu Glu Asp Tyr Ala Glu Thr
435 440 445

Ile Ala His Ile Leu Ser Met Ser Ala Glu Lys Arg Leu Gln Ile Arg
450 455 460

Lys Ser Ala Arg Ala Ser Val Ser Arg Phe Ser Asp Gln Glu Phe Glu
465 470 475 480

Val Thr Phe Leu Ser Ser Val Glu Lys Leu Phe Lys
485 490

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<212> DNA
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gttttatggt gtgctttaag agccctgcag aaaaagtatc ctgaagcagt ttatgttgtt 300
tataccggcg atgttaatgt caacggtcaa cagatactag aaggtgcttt cagaagattt 360

aacatcagat taattcaccc agtgcagttt gtttttttaa ggaaacgcta tcttgtggaa 420
gattcactgt atcctcactt cacactgctg ggccaaagtc taggatccat ttttcttggc 480
tgggaagctc taatgcagtg tgttcctgat gtttacattg attcaatggg atacgctttt 540
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ggcggaagat ggcggccggc gaaaggagct ggtgcctgtg caagttgttg aggttttttt 1620
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<210> 20
<211> 559
<212> PRT
<213> Homo sapiens

<400> 20

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Met Arg Lys Phe Ala Tyr Cys Lys Val Val Leu Ala Thr Ser Leu Ile
  1               5                  10                  15

Trp Val Leu Leu Asp Met Phe Leu Leu Leu Tyr Phe Ser Glu Cys Asn
             20                  25                  30

Lys Cys Asp Glu Lys Lys Glu Arg Gly Leu Pro Ala Gly Asp Val Leu
         35                  40                  45

Glu Pro Val Gln Lys Pro His Glu Gly Pro Gly Glu Met Gly Lys Pro
     50                  55                  60

Val Val Ile Pro Lys Glu Asp Gln Glu Lys Met Lys Glu Met Phe Lys
```

65 70 75 80

Ile Asn Gln Phe Asn Leu Met Ala Ser Glu Met Ile Ala Leu Asn Arg
85 90 95

Ser Leu Pro Asp Val Arg Leu Glu Gly Cys Lys Thr Lys Val Tyr Pro
100 105 110

Asp Asn Leu Pro Thr Thr Ser Val Val Ile Val Phe His Asn Glu Ala
115 120 125

Trp Ser Thr Leu Leu Arg Thr Val His Ser Val Ile Asn Arg Ser Pro
130 135 140

Arg His Met Ile Glu Glu Ile Val Leu Val Asp Asp Ala Ser Glu Arg
145 150 155 160

Asp Phe Leu Lys Arg Pro Leu Glu Ser Tyr Val Lys Lys Leu Lys Val
165 170 175

Pro Val His Val Ile Arg Met Glu Gln Arg Ser Gly Leu Ile Arg Ala
180 185 190

Arg Leu Lys Gly Ala Ala Val Ser Lys Gly Gln Val Ile Thr Phe Leu
195 200 205

Asp Ala His Cys Glu Cys Thr Val Gly Trp Leu Glu Pro Leu Leu Ala
210 215 220

Arg Ile Lys His Asp Arg Arg Thr Val Val Cys Pro Ile Ile Asp Val
225 230 235 240

Ile Ser Asp Asp Thr Phe Glu Tyr Met Ala Gly Ser Asp Met Thr Tyr
245 250 255

Gly Gly Phe Asn Trp Lys Leu Asn Phe Arg Trp Tyr Pro Val Pro Gln
260 265 270

Arg Glu Met Asp Arg Arg Lys Gly Asp Arg Thr Leu Pro Val Arg Thr
275 280 285

Pro Thr Met Ala Gly Gly Leu Phe Ser Ile Asp Arg Asp Tyr Phe Gln
290 295 300

Glu Ile Gly Thr Tyr Asp Ala Gly Met Asp Ile Trp Gly Gly Glu Asn
305 310 315 320

Leu Glu Ile Ser Phe Arg Ile Trp Gln Cys Gly Gly Thr Leu Glu Ile

325 330 335

Val Thr Cys Ser His Val Gly His Val Phe Arg Lys Ala Thr Pro Tyr
340 345 350

Thr Phe Pro Gly Gly Thr Gly Gln Ile Ile Asn Lys Asn Asn Arg Arg
355 360 365

Leu Ala Glu Val Trp Met Asp Glu Phe Lys Asn Phe Phe Tyr Ile Ile
370 375 380

Ser Pro Gly Val Thr Lys Val Asp Tyr Gly Asp Ile Ser Ser Arg Val
385 390 395 400

Gly Leu Arg His Lys Leu Gln Cys Lys Pro Phe Ser Trp Tyr Leu Glu
405 410 415

Asn Ile Tyr Pro Asp Ser Gln Ile Pro Arg His Tyr Phe Ser Leu Gly
420 425 430

Glu Ile Arg Lys Glu Glu Thr Asn Gln Cys Leu Asp Asn Met Ala Arg
435 440 445

Lys Glu Asn Glu Lys Val Gly Ile Phe Asn Cys His Gly Met Gly Gly
450 455 460

Asn Gln Val Phe Ser Tyr Thr Ala Asn Lys Glu Ile Arg Thr Asp Asp
465 470 475 480

Leu Cys Leu Asp Val Ser Lys Leu Asn Gly Pro Val Thr Met Leu Lys
485 490 495

Cys His His Leu Lys Gly Asn Gln Leu Trp Glu Tyr Asp Pro Val Lys
500 505 510

Leu Thr Leu Gln His Val Asn Ser Asn Gln Cys Leu Asp Lys Ala Thr
515 520 525

Glu Glu Asp Ser Gln Val Pro Ser Ile Arg Asp Cys Asn Gly Ser Arg
530 535 540

Ser Gln Gln Trp Leu Leu Arg Asn Val Thr Leu Pro Glu Ile Phe
545 550 555

<210> 21
<211> 559
<212> PRT

<213> Rattus sp.

<400> 21

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Met Arg Lys Phe Ala Tyr Cys Lys Val Val Leu Ala Thr Ser Leu Val
  1               5                  10                  15

Trp Val Leu Leu Asp Met Phe Leu Leu Leu Tyr Phe Ser Glu Cys Asn
             20                  25                  30

Lys Cys Glu Glu Lys Lys Glu Arg Gly Leu Pro Ala Gly Asp Val Leu
         35                  40                  45

Glu Leu Val Gln Lys Pro His Glu Gly Pro Gly Glu Met Gly Lys Pro
     50                  55                  60

Val Val Ile Pro Lys Glu Asp Gln Glu Lys Met Lys Glu Met Phe Lys
 65                  70                  75                  80

Ile Asn Gln Phe Asn Leu Met Ala Ser Glu Met Ile Ala Phe Asn Arg
                 85                  90                  95

Ser Leu Pro Asp Val Arg Leu Glu Gly Cys Lys Thr Lys Val Tyr Pro
            100                 105                 110

Asp Ser Leu Pro Thr Thr Ser Val Val Ile Val Phe His Asn Glu Ala
        115                 120                 125

Trp Ser Thr Leu Leu Arg Thr Val His Ser Val Ile Asn Arg Ser Pro
    130                 135                 140

Arg His Met Ile Glu Glu Ile Val Leu Val Asp Asp Ala Ser Glu Arg
145                 150                 155                 160

Asp Phe Leu Lys Arg Pro Leu Glu Ser Tyr Val Lys Lys Leu Lys Val
                165                 170                 175

Pro Val His Val Ile Arg Met Glu Gln Arg Ser Gly Leu Ile Arg Ala
            180                 185                 190

Arg Leu Lys Gly Ala Ala Val Ser Lys Gly Gln Val Ile Thr Phe Leu
        195                 200                 205

Asp Ala His Cys Glu Cys Thr Val Gly Trp Leu Glu Pro Leu Leu Ala
    210                 215                 220

Arg Ile Lys His Asp Arg Arg Thr Val Val Cys Pro Ile Ile Asp Val
225                 230                 235                 240
```

```
Ile Ser Asp Asp Thr Phe Glu Tyr Met Ala Gly Ser Asp Met Thr Tyr
                245                 250                 255

Gly Gly Phe Asn Trp Lys Leu Asn Phe Arg Trp Tyr Pro Val Pro Gln
            260                 265                 270

Arg Glu Met Asp Arg Arg Lys Gly Asp Arg Thr Leu Pro Val Arg Thr
        275                 280                 285

Pro Thr Met Ala Gly Gly Leu Phe Ser Ile Asp Arg Asp Tyr Phe Gln
    290                 295                 300

Glu Ile Gly Thr Tyr Asp Ala Gly Met Asp Ile Trp Gly Gly Glu Asn
305                 310                 315                 320

Leu Glu Ile Ser Phe Arg Ile Trp Gln Cys Gly Gly Thr Leu Glu Ile
                325                 330                 335

Val Thr Cys Ser His Val Gly His Val Phe Arg Lys Ala Thr Pro Tyr
            340                 345                 350

Thr Phe Pro Gly Gly Thr Gly Gln Ile Ile Asn Lys Asn Asn Arg Arg
        355                 360                 365

Leu Ala Glu Val Trp Met Asp Glu Phe Lys Asn Phe Phe Tyr Ile Ile
    370                 375                 380

Ser Pro Gly Val Thr Lys Val Asp Tyr Gly Asp Ile Ser Ser Arg Val
385                 390                 395                 400

Gly Leu Arg His Lys Leu Gln Cys Lys Pro Phe Ser Trp Tyr Leu Glu
                405                 410                 415

Asn Ile Tyr Pro Asp Ser Gln Ile Pro Arg His Tyr Phe Ser Leu Gly
            420                 425                 430

Glu Ile Arg Asn Val Glu Thr Asn Gln Cys Leu Asp Asn Met Ala Arg
        435                 440                 445

Lys Glu Asn Glu Lys Val Gly Ile Phe Asn Cys His Gly Met Gly Gly
    450                 455                 460

Asn Gln Val Phe Ser Tyr Thr Ala Asn Lys Glu Ile Arg Thr Asp Asp
465                 470                 475                 480

Leu Cys Leu Asp Val Ser Lys Leu Asn Gly Pro Val Thr Met Leu Lys
                485                 490                 495
```

```
Cys His His Leu Lys Gly Asn Gln Leu Trp Glu Tyr Asp Pro Val Lys
            500                 505                 510

Leu Thr Leu Gln His Val Asn Ser Asn Gln Cys Leu Asp Lys Ala Thr
        515                 520                 525

Glu Glu Asp Ser Gln Val Pro Ser Ile Arg Asp Cys Thr Gly Ser Arg
    530                 535                 540

Ser Gln Gln Trp Leu Leu Arg Asn Val Thr Leu Pro Glu Ile Phe
545                 550                 555
```

<210> 22
<211> 559
<212> PRT
<213> Mus sp.

<400> 22

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Met Arg Lys Phe Ala Tyr Cys Lys Val Val Leu Ala Thr Ser Leu Val
  1               5                  10                  15

Trp Val Leu Leu Asp Met Phe Leu Leu Leu Tyr Phe Ser Glu Cys Asn
             20                  25                  30

Lys Cys Glu Glu Lys Gln Glu Arg Gly Leu Pro Ala Gly Asp Val Leu
         35                  40                  45

Glu Leu Val Gln Lys Pro His Glu Gly Pro Gly Glu Met Gly Lys Pro
     50                  55                  60

Val Val Ile Pro Lys Glu Asp Gln Glu Lys Met Lys Glu Met Phe Lys
 65                  70                  75                  80

Ile Asn Gln Phe Asn Leu Met Ala Ser Glu Met Ile Ala Leu Asn Arg
                 85                  90                  95

Ser Leu Pro Asp Val Arg Leu Glu Gly Cys Lys Thr Lys Val Tyr Pro
            100                 105                 110

Asp Asn Leu Pro Thr Thr Ser Val Val Ile Val Phe His Asn Glu Ala
        115                 120                 125

Trp Ser Thr Leu Leu Arg Thr Val His Ser Val Ile Asn Arg Ser Pro
    130                 135                 140

Arg His Met Ile Glu Glu Ile Val Leu Val Asp Asp Ala Ser Glu Arg
145                 150                 155                 160
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Asp Phe Leu Lys Arg Pro Leu Glu Ser Tyr Val Lys Lys Leu Lys Val
165 170 175

Pro Val His Val Ile Arg Met Glu Gln Arg Ser Gly Leu Ile Arg Ala
180 185 190

Arg Leu Lys Gly Ala Ala Val Ser Arg Gly Gln Val Ile Thr Phe Leu
195 200 205

Asp Ala His Cys Glu Cys Thr Ala Gly Trp Leu Glu Pro Leu Leu Ala
210 215 220

Arg Ile Lys His Asp Arg Arg Thr Val Val Cys Pro Ile Ile Asp Val
225 230 235 240

Ile Ser Asp Asp Thr Phe Glu Tyr Met Ala Gly Ser Asp Met Thr Tyr
245 250 255

Gly Gly Phe Asn Trp Lys Leu Asn Phe Arg Trp Tyr Pro Val Pro Gln
260 265 270

Arg Glu Met Asp Arg Arg Lys Gly Asp Arg Thr Leu Pro Val Arg Thr
275 280 285

Pro Thr Met Ala Gly Gly Leu Phe Ser Ile Asp Arg Asp Tyr Phe Gln
290 295 300

Glu Ile Gly Thr Tyr Asp Ala Gly Met Asp Ile Trp Gly Gly Glu Asn
305 310 315 320

Leu Glu Ile Ser Phe Arg Ile Trp Gln Cys Gly Gly Thr Leu Glu Ile
325 330 335

Val Thr Cys Ser His Val Gly His Val Phe Arg Lys Ala Thr Pro Tyr
340 345 350

Thr Phe Pro Gly Gly Thr Gly Gln Ile Ile Asn Lys Asn Asn Arg Arg
355 360 365

Leu Ala Glu Val Trp Met Asp Glu Phe Lys Asn Phe Phe Tyr Ile Ile
370 375 380

Ser Pro Gly Val Thr Lys Val Asp Tyr Gly Asp Ile Ser Ser Arg Leu
385 390 395 400

Gly Leu Arg Arg Lys Leu Gln Cys Lys Pro Phe Ser Trp Tyr Leu Glu
405 410 415

Asn Ile Tyr Pro Asp Ser Gln Ile Pro Arg His Tyr Phe Ser Leu Gly
420 425 430

Glu Ile Arg Asn Val Glu Thr Asn Gln Cys Leu Asp Asn Met Ala Arg
435 440 445

Lys Glu Asn Glu Lys Val Gly Ile Phe Asn Cys His Gly Met Gly Gly
450 455 460

Asn Gln Val Phe Ser Tyr Thr Ala Asn Lys Glu Ile Arg Thr Asp Asp
465 470 475 480

Leu Cys Leu Asp Val Ser Lys Leu Asn Gly Pro Val Thr Met Leu Lys
485 490 495

Cys His His Leu Lys Gly Asn Gln Leu Trp Glu Tyr Asp Pro Val Lys
500 505 510

Leu Thr Leu Gln His Val Asn Ser Asn Gln Cys Leu Asp Lys Ala Thr
515 520 525

Glu Glu Asp Ser Gln Val Pro Ser Ile Arg Asp Cys Thr Gly Ser Arg
530 535 540

Ser Gln Gln Trp Leu Leu Arg Asn Val Thr Leu Pro Glu Ile Phe
545 550 555

<210> 23
<211> 559
<212> PRT
<213> Bos sp.

<400> 23
Met Arg Lys Phe Ala Tyr Cys Lys Val Val Leu Ala Thr Ser Leu Ile
1 5 10 15

Trp Val Leu Leu Asp Met Phe Leu Leu Leu Tyr Phe Ser Glu Cys Asn
20 25 30

Lys Cys Asp Glu Lys Lys Glu Arg Gly Leu Pro Ala Gly Asp Val Leu
35 40 45

Glu Pro Val Gln Lys Pro His Glu Gly Pro Gly Glu Met Gly Lys Pro
50 55 60

Val Val Ile Pro Lys Glu Asp Gln Glu Lys Met Lys Glu Met Phe Lys

65 70 75 80

Ile Asn Gln Phe Asn Leu Met Ala Ser Glu Met Ile Ala Leu Asn Arg
85 90 95

Ser Leu Pro Asp Val Arg Leu Glu Gly Cys Lys Thr Lys Val Tyr Pro
100 105 110

Asp Asn Leu Pro Thr Thr Ser Val Val Ile Val Phe His Asn Glu Ala
115 120 125

Trp Ser Thr Leu Leu Arg Thr Val His Ser Val Ile Asn Arg Ser Pro
130 135 140

Arg His Met Leu Glu Glu Ile Val Leu Val Asp Asp Ala Ser Glu Arg
145 150 155 160

Asp Phe Leu Lys Arg Pro Leu Glu Ser Tyr Val Lys Lys Leu Lys Val
165 170 175

Pro Val His Val Ile Arg Met Glu Gln Arg Ser Gly Leu Ile Arg Ala
180 185 190

Arg Leu Lys Gly Ala Ala Val Ser Lys Gly Gln Val Ile Thr Phe Leu
195 200 205

Asp Ala His Cys Glu Cys Thr Val Gly Trp Leu Glu Pro Leu Leu Ala
210 215 220

Arg Ile Lys His Asp Arg Lys Thr Val Val Cys Pro Ile Ile Asp Val
225 230 235 240

Ile Ser Asp Asp Thr Phe Glu Tyr Met Ala Gly Ser Asp Met Thr Tyr
245 250 255

Gly Gly Phe Asn Trp Lys Leu Asn Phe Arg Trp Tyr Pro Val Pro Gln
260 265 270

Arg Glu Met Asp Arg Arg Lys Gly Asp Arg Thr Leu Pro Val Arg Thr
275 280 285

Pro Thr Met Ala Gly Gly Leu Phe Ser Ile Asp Arg Asp Tyr Phe Gln
290 295 300

Glu Ile Gly Thr Tyr Asp Ala Gly Met Asp Ile Trp Gly Gly Glu Asn
305 310 315 320

Leu Glu Ile Ser Phe Arg Ile Trp Gln Cys Gly Gly Thr Leu Glu Ile

325 330 335

Val Thr Cys Ser His Val Gly His Val Phe Arg Lys Ala Thr Pro Tyr
340 345 350

Thr Phe Pro Gly Gly Thr Gly Gln Ile Ile Asn Lys Asn Asn Arg Arg
355 360 365

Leu Ala Glu Val Trp Met Asp Glu Phe Lys Asn Phe Phe Tyr Ile Ile
370 375 380

Ser Pro Gly Val Thr Lys Val Asp Tyr Gly Asp Ile Ser Ser Arg Leu
385 390 395 400

Gly Leu Arg His Lys Leu Gln Cys Arg Pro Phe Ser Trp Tyr Leu Glu
405 410 415

Asn Ile Tyr Pro Asp Ser Gln Ile Pro Arg His Tyr Phe Ser Leu Gly
420 425 430

Glu Ile Arg Asn Val Glu Thr Asn Gln Cys Leu Asp Asn Met Ala Arg
435 440 445

Lys Glu Asn Glu Lys Val Gly Ile Phe Asn Cys His Gly Met Gly Gly
450 455 460

Asn Gln Val Phe Ser Tyr Thr Ala Asn Lys Glu Ile Arg Thr Asp Asp
465 470 475 480

Leu Cys Leu Asp Val Ser Lys Leu Asn Gly Pro Val Thr Met Leu Lys
485 490 495

Cys His His Leu Lys Gly Asn Gln Leu Trp Glu Tyr Asp Pro Val Lys
500 505 510

Leu Thr Leu Gln His Val Asn Ser Asn Gln Cys Leu Asp Lys Ala Thr
515 520 525

Asp Glu Asp Ser Gln Val Pro Ser Ile Arg Asp Cys Ser Gly Ser Arg
530 535 540

Ser Gln Gln Trp Leu Leu Arg Asn Val Thr Leu Pro Glu Ile Phe
545 550 555

<210> 24
<211> 559
<212> PRT

<213> Sus sp.

<400> 24

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Met Arg Lys Phe Ala Tyr Cys Lys Val Val Leu Ala Thr Ser Leu Ile
  1               5                  10                  15

Trp Val Leu Leu Asp Met Phe Leu Leu Leu Tyr Phe Ser Glu Cys Asn
             20                  25                  30

Lys Cys Asp Glu Lys Lys Glu Arg Gly Leu Pro Ala Gly Asp Val Leu
         35                  40                  45

Glu Pro Val Gln Lys Pro His Glu Gly Pro Gly Glu Met Gly Lys Pro
     50                  55                  60

Val Val Ile Pro Lys Glu Asp Gln Asp Lys Met Lys Glu Met Phe Lys
 65                  70                  75                  80

Ile Asn Gln Phe Asn Leu Met Ala Ser Glu Met Ile Ala Leu Asn Arg
                 85                  90                  95

Ser Leu Pro Asp Val Arg Leu Glu Gly Cys Lys Thr Lys Val Tyr Pro
            100                 105                 110

Asp Asn Leu Pro Thr Thr Ser Val Val Ile Val Phe His Asn Glu Ala
        115                 120                 125

Trp Ser Thr Leu Leu Arg Thr Val His Ser Val Ile Asn Arg Ser Pro
    130                 135                 140

Arg His Met Leu Glu Glu Ile Val Leu Val Asp Asp Ala Ser Glu Arg
145                 150                 155                 160

Asp Phe Leu Lys Arg Pro Leu Glu Ser Tyr Val Lys Lys Leu Lys Val
                165                 170                 175

Pro Val His Val Ile Arg Met Glu Gln Arg Ser Gly Leu Ile Arg Ala
            180                 185                 190

Arg Leu Lys Gly Ala Ala Val Ser Lys Gly Gln Val Ile Thr Phe Leu
        195                 200                 205

Asp Ala His Cys Glu Cys Thr Val Gly Trp Leu Glu Pro Leu Leu Ala
    210                 215                 220

Arg Ile Lys His Asp Arg Lys Thr Val Val Cys Pro Ile Ile Asp Val
225                 230                 235                 240
```

Ile Ser Asp Asp Thr Phe Glu Tyr Met Ala Gly Ser Asp Met Thr Tyr
245 250 255

Gly Gly Phe Asn Trp Lys Leu Asn Phe Arg Trp Tyr Pro Val Pro Gln
260 265 270

Arg Glu Met Asp Arg Arg Lys Gly Asp Arg Thr Leu Pro Val Arg Thr
275 280 285

Pro Thr Met Ala Gly Gly Leu Phe Ser Ile Asp Arg Asp Tyr Phe Gln
290 295 300

Glu Ile Gly Thr Tyr Asp Ala Gly Met Asp Ile Trp Gly Gly Glu Asn
305 310 315 320

Leu Glu Ile Ser Phe Arg Ile Trp Gln Cys Gly Gly Thr Leu Glu Ile
325 330 335

Val Thr Cys Ser His Val Gly His Val Phe Arg Lys Ala Thr Pro Tyr
340 345 350

Thr Phe Pro Gly Gly Thr Gly Gln Ile Ile Asn Lys Asn Asn Arg Arg
355 360 365

Leu Ala Glu Val Trp Met Asp Glu Phe Lys Thr Phe Phe Tyr Ile Ile
370 375 380

Ser Pro Gly Val Thr Lys Val Asp Tyr Gly Asp Ile Ser Ser Arg Leu
385 390 395 400

Gly Leu Arg His Lys Leu Gln Cys Arg Pro Phe Ser Trp Tyr Leu Glu
405 410 415

Asn Ile Tyr Pro Asp Ser Gln Ile Pro Arg His Tyr Ser Ser Leu Gly
420 425 430

Glu Ile Arg Asn Val Glu Thr Asn Gln Cys Leu Asp Asn Met Ala Arg
435 440 445

Lys Glu Asn Glu Lys Val Gly Ile Phe Asn Cys His Gly Met Gly Gly
450 455 460

Asn Gln Val Phe Ser Tyr Thr Ala Asn Lys Glu Ile Arg Thr Asp Asp
465 470 475 480

Leu Cys Leu Asp Val Ser Lys Leu Asn Gly Pro Val Thr Met Leu Lys
485 490 495

Cys His His Leu Lys Gly Asn Gln Leu Trp Glu Tyr Asp Pro Val Lys
500 505 510

Leu Thr Leu Gln His Val Asn Ser Asn Gln Cys Leu Asp Lys Ala Thr
515 520 525

Glu Glu Asp Ser Gln Val Pro Ser Ile Arg Asp Cys Ser Gly Ser Arg
530 535 540

Ser Gln Gln Trp Leu Leu Arg Asn Val Thr Leu Pro Glu Ile Phe
545 550 555

<210> 25
<211> 612
<212> PRT
<213> Caenorhabditis elegans

<400> 25
Met Leu Ser Val Gly Gly Gly Arg Ser Ala Val Cys Arg Ala Val Ile
1 5 10 15

Ala Thr Ser Ile Val Trp Leu Leu Ile Asp Val Val Ile Leu Phe Tyr
20 25 30

Tyr Leu Asp Pro Ser Thr Ser Gln Gln Gln Pro Phe Pro Glu Asp Asn
35 40 45

Arg Ile Leu Asn Arg Ala Arg Arg Ile Glu Pro Leu Pro Pro Ala Ala
50 55 60

Gln His Asp Ser Asp Pro Asp Ala His Pro Ile Gln Pro Glu Lys Gln
65 70 75 80

Glu Lys Gln Val Tyr Pro Val Asp Lys Glu Thr Ala Asn Gln Leu Arg
85 90 95

Lys Leu Met Glu Thr Gln Ala Phe Gly Pro Gly Tyr His Gly Gln Gly
100 105 110

Gly Thr Gly Val Thr Val Pro Glu Asp Lys Lys Thr Ile Lys Glu Lys
115 120 125

Arg Phe Leu Glu Asn Gln Phe Asn Val Val Ala Ser Glu Met Ile Ser
130 135 140

Val Asn Arg Thr Leu Pro Asp Tyr Arg Ser Asp Ala Cys Arg Thr Ser
145 150 155 160

Gly Asn Asn Leu Lys Thr Ala Gly Met Pro Lys Thr Ser Ile Ile Ile
165 170 175

Val Phe His Asn Glu Ala Trp Thr Thr Leu Leu Arg Thr Leu His Ser
180 185 190

Val Ile Asn Arg Ser Pro Arg His Leu Leu Glu Glu Ile Ile Leu Val
195 200 205

Asp Asp Lys Ser Asp Arg Asp Tyr Leu Val Lys Pro Leu Asp Ser Tyr
210 215 220

Ile Lys Met Phe Pro Ile Pro Ile His Leu Val His Leu Glu Asn Arg
225 230 235 240

Ser Gly Leu Ile Arg Ala Arg Leu Thr Gly Ser Glu Met Ala Lys Gly
245 250 255

Lys Ile Leu Leu Phe Leu Asp Ala His Val Glu Val Thr Asp Gly Trp
260 265 270

Leu Glu Pro Leu Val Ser Arg Val Ala Glu Asp Arg Lys Arg Val Val
275 280 285

Ala Pro Ile Ile Asp Val Ile Ser Asp Asp Thr Phe Glu Tyr Val Thr
290 295 300

Ala Ser Glu Thr Thr Trp Gly Gly Phe Asn Trp His Leu Asn Phe Arg
305 310 315 320

Trp Tyr Ala Val Pro Lys Arg Glu Leu Asn Arg Arg Gly Ser Asp Arg
325 330 335

Ser Met Pro Ile Gln Thr Pro Thr Ile Ala Gly Gly Leu Phe Ala Ile
340 345 350

Asp Lys Gln Phe Phe Tyr Asp Ile Gly Ser Tyr Asp Glu Gly Met Gln
355 360 365

Val Trp Gly Gly Glu Asn Leu Glu Ile Ser Phe Arg Val Trp Met Cys
370 375 380

Gly Gly Ser Leu Glu Ile His Pro Cys Ser Arg Val Gly His Val Phe
385 390 395 400

Arg Lys Gln Thr Pro Tyr Thr Phe Pro Gly Gly Thr Ala Lys Val Ile
405 410 415

His His Asn Ala Ala Arg Thr Ala Glu Val Trp Met Asp Glu Tyr Lys
420 425 430

Ala Phe Phe Tyr Lys Met Val Pro Ala Ala Arg Asn Val Glu Ala Gly
435 440 445

Asp Val Ser Glu Arg Lys Lys Leu Arg Glu Thr Leu Gln Cys Lys Ser
450 455 460

Phe Lys Trp Tyr Leu Glu Asn Ile Tyr Pro Glu Ala Pro Leu Pro Ala
465 470 475 480

Asp Phe Arg Ser Leu Gly Ala Ile Val Asn Arg Phe Thr Glu Lys Cys
485 490 495

Val Asp Thr Asn Gly Lys Lys Asp Gly Gln Ala Pro Gly Ile Gln Ala
500 505 510

Cys His Gly Ala Gly Gly Asn Gln Ala Trp Ser Leu Thr Gly Lys Gly
515 520 525

Glu Ile Arg Ser Asp Asp Leu Cys Leu Ser Ser Gly His Val Tyr Gln
530 535 540

Ile Gly Ser Glu Leu Lys Leu Glu Arg Cys Ser Val Ser Lys Ile Asn
545 550 555 560

Val Lys His Val Phe Val Phe Asp Asp Gln Ala Gly Thr Leu Leu His
565 570 575

Lys Lys Thr Gly Lys Cys Val Thr Gly Ala Asp Gln Arg Val Thr Leu
580 585 590

Asp Glu Cys Gly Leu Gly Arg Lys Asp Gln Met Trp Gln Leu Glu Gly
595 600 605

Tyr Gln Ser Pro
610

<210> 26
<211> 589
<212> PRT
<213> Caenorhabditis elegans

<400> 26
Met Leu Pro Arg Met Leu Lys Met Lys Thr Val Gly Thr Val Leu Ala

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 1               5                  10                  15

Val Ile Trp Leu Phe Gly Leu Ala Phe Ile Tyr Val Gln Ser Thr Ser
            20                  25                  30

Ser Ser Leu Arg Pro Pro Gly Arg His Pro Pro Pro Leu Pro Gln Leu
        35                  40                  45

Asp Pro Leu Ile Pro Gln Asn Pro Pro Gln Asn Asp Glu Ile Arg Pro
    50                  55                  60

Lys Lys Ser Ala Pro Pro Ile Pro Thr Ile Asn Leu Ala Glu Asp Thr
65                  70                  75                  80

Thr Ile His Glu Arg Thr Glu Lys Asp Val Thr Trp Lys Thr Phe Asp
                85                  90                  95

Val Glu Lys Phe Leu Asn Lys Gly Lys Trp His Gln Gly Glu Asp Lys
            100                 105                 110

Tyr Lys Ala Asn Ser Phe Asn Gln Glu Ala Ser Asp Ala Leu Asn Pro
        115                 120                 125

Thr Arg Lys Ile Pro Asp Ser Arg Glu Pro Gln Cys Arg Asp Val Asp
    130                 135                 140

Tyr Ser Lys Val Gly Met Gln Pro Thr Thr Val Ile Ile Thr Tyr His
145                 150                 155                 160

Asn Glu Ala Arg Ser Ser Leu Leu Arg Thr Val Phe Ser Val Phe Asn
                165                 170                 175

Gln Ser Pro Glu Glu Leu Leu Leu Glu Ile Val Leu Val Asp Asp Asn
            180                 185                 190

Ser Gln Asp Val Glu Ile Gly Lys Glu Leu Ala Gln Ile Gln Arg Ile
        195                 200                 205

Thr Val Leu Arg Asn Asn Gln Arg Glu Gly Leu Ile Arg Ser Arg Val
    210                 215                 220

Lys Gly Ala Gln Val Ala Arg Ala Pro Val Leu Thr Phe Leu Asp Ser
225                 230                 235                 240

His Ile Glu Cys Asn Gln Lys Trp Leu Glu Pro Leu Leu Ala Arg Ile
                245                 250                 255

Ala Glu Asn Pro Lys Ala Val Val Ala Pro Ile Ile Asp Val Ile Asn
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            260                 265                 270

Val Asp Asn Phe Asn Tyr Val Gly Ala Ser Ala Asp Leu Arg Gly Gly
        275                 280                 285

Phe Asp Trp Thr Leu Val Phe Arg Trp Glu Phe Met Asn Glu Gln Leu
    290                 295                 300

Arg Lys Glu Arg His Ala His Pro Thr Ala Pro Ile Arg Ser Pro Thr
305                 310                 315                 320

Met Ala Gly Gly Leu Phe Ala Ile Ser Lys Glu Trp Phe Asn Glu Leu
                325                 330                 335

Gly Thr Tyr Asp Leu Asp Met Glu Val Trp Gly Gly Glu Asn Leu Glu
            340                 345                 350

Met Ser Phe Arg Val Trp Gln Cys Gly Gly Ser Leu Glu Ile Met Pro
        355                 360                 365

Cys Ser Arg Val Gly His Val Phe Arg Lys Lys His Pro Tyr Thr Phe
    370                 375                 380

Pro Gly Gly Ser Gly Asn Val Phe Gln Lys Asn Thr Arg Arg Ala Ala
385                 390                 395                 400

Glu Val Trp Met Asp Glu Tyr Lys Ala Ile Tyr Leu Lys Asn Val Pro
                405                 410                 415

Ser Ala Arg Phe Val Asn Phe Gly Asp Ile Thr Asp Arg Leu Ala Ile
            420                 425                 430

Arg Asp Arg Leu Gln Cys Lys Ser Phe Lys Trp Tyr Leu Glu Asn Val
        435                 440                 445

Tyr Pro Gln Leu Glu Ile Pro Arg Lys Thr Pro Gly Lys Ser Phe Gln
    450                 455                 460

Met Lys Ile Gly Asn Leu Cys Leu Asp Ser Met Ala Arg Lys Glu Ser
465                 470                 475                 480

Glu Ala Pro Gly Leu Phe Gly Cys His Gly Thr Gly Gly Asn Gln Glu
                485                 490                 495

Trp Val Phe Asp Gln Leu Thr Lys Thr Phe Lys Asn Ala Ile Ser Gln
            500                 505                 510

Leu Cys Leu Asp Phe Ser Ser Asn Thr Glu Asn Lys Thr Val Thr Met
```

```
        515                 520                 525

Val Lys Cys Glu Asn Leu Arg Pro Asp Thr Met Val Val Glu Lys Asn
    530                 535                 540

Gly Trp Leu Thr Gln Gly Gly Lys Cys Leu Thr Val Asn Gln Gly Ser
545                 550                 555                 560

Gly Gly Asp Trp Leu Ile Tyr Gly Ala His Cys Glu Leu Asn Asn Gly
                565                 570                 575

Ala Gln Arg Trp Ile Phe Glu Lys Leu Asp Thr Tyr Glu
            580                 585
```



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<210> 27
<211> 626
<212> PRT
<213> Caenorhabditis elegans

<400> 27
Met Ile Ile Phe Lys Lys Lys Ala Ile Leu Lys Val Leu Leu Leu Val
  1               5                  10                  15

Pro Val Phe Trp Ile Cys Ser Leu Ile Phe Phe Ala Ala Thr Ser Asn
             20                  25                  30

Asp Ser Ser Gln Ile Gly Ser Asn Asn Asp Leu Ala Asn Lys Ile Ala
         35                  40                  45

Glu Ala Asn Phe His Pro Lys Ala Ala Lys Gln Asp Val Ile Gln Gly
     50                  55                  60

Phe Gly Pro Pro Ile Glu Pro Glu Pro Val Val Glu Asn Asn Lys Val
 65                  70                  75                  80

Glu Glu Glu Glu Gln Pro Gly Gly Asn Leu Ala Lys Pro Lys Phe Met
                85                  90                  95

Val Asp Pro Asn Asp Pro Ile Tyr Lys Lys Gly Asp Ala Ala Gln Ala
            100                 105                 110

Gly Glu Leu Gly Lys Ala Val Val Val Asp Lys Thr Lys Leu Ser Thr
        115                 120                 125

Glu Glu Lys Ala Lys Tyr Asp Lys Gly Met Leu Asn Asn Ala Phe Asn
    130                 135                 140
```

```
Gln Tyr Ala Ser Asp Met Ile Ser Val His Arg Thr Leu Pro Thr Asn
145                 150                 155                 160

Ile Asp Ala Glu Cys Lys Thr Glu Lys Tyr Asn Glu Asn Leu Pro Arg
                165                 170                 175

Thr Ser Val Ile Ile Cys Phe His Asn Glu Ala Trp Ser Val Leu Leu
            180                 185                 190

Arg Thr Val His Ser Val Leu Glu Arg Thr Pro Asp His Leu Leu Glu
        195                 200                 205

Glu Val Val Leu Val Asp Asp Phe Ser Asp Met Asp His Thr Lys Arg
    210                 215                 220

Pro Leu Glu Glu Tyr Met Ser Gln Phe Gly Gly Lys Val Lys Ile Leu
225                 230                 235                 240

Arg Met Glu Lys Arg Glu Gly Leu Ile Arg Ala Arg Leu Arg Gly Ala
                245                 250                 255

Ala Val Ala Thr Gly Glu Val Leu Thr Tyr Leu Asp Ser His Cys Glu
            260                 265                 270

Cys Met Glu Gly Trp Met Glu Pro Leu Leu Asp Arg Ile Lys Arg Asp
        275                 280                 285

Pro Thr Thr Val Val Cys Pro Val Ile Asp Val Ile Asp Asp Asn Thr
    290                 295                 300

Phe Glu Tyr His His Ser Lys Ala Tyr Phe Thr Ser Val Gly Gly Phe
305                 310                 315                 320

Asp Trp Gly Leu Gln Phe Asn Trp His Ser Ile Pro Glu Arg Asp Arg
                325                 330                 335

Lys Asn Arg Thr Arg Pro Ile Asp Pro Val Arg Ser Pro Thr Met Ala
            340                 345                 350

Gly Gly Leu Phe Ser Ile Asp Lys Glu Tyr Phe Glu Lys Leu Gly Thr
        355                 360                 365

Tyr Asp Pro Gly Phe Asp Ile Trp Gly Gly Glu Asn Leu Glu Leu Ser
    370                 375                 380

Phe Lys Ile Trp Met Cys Gly Gly Thr Leu Glu Ile Val Pro Cys Ser
385                 390                 395                 400
```

```
His Val Gly His Val Phe Arg Lys Arg Ser Pro Tyr Lys Trp Arg Thr
                405                 410                 415

Gly Val Asn Val Leu Lys Arg Asn Ser Ile Arg Leu Ala Glu Val Trp
            420                 425                 430

Leu Asp Asp Tyr Lys Thr Tyr Tyr Tyr Glu Arg Ile Asn Asn Gln Leu
        435                 440                 445

Gly Asp Phe Gly Asp Ile Ser Ser Arg Lys Lys Leu Arg Glu Asp Leu
    450                 455                 460

Gly Cys Lys Ser Phe Lys Trp Tyr Leu Asp Asn Ile Tyr Pro Glu Leu
465                 470                 475                 480

Phe Val Pro Gly Glu Ser Val Ala Lys Gly Glu Val Arg Asn Ser Ala
                485                 490                 495

Val Gln Pro Ala Arg Cys Leu Asp Cys Met Val Gly Arg His Glu Lys
            500                 505                 510

Asn Arg Pro Val Gly Thr Tyr Gln Cys His Gly Gln Gly Gly Asn Gln
        515                 520                 525

Tyr Trp Met Leu Ser Lys Asp Gly Glu Ile Arg Arg Asp Glu Ser Cys
    530                 535                 540

Val Asp Tyr Ala Gly Ser Asp Val Met Val Phe Pro Cys His Gly Met
545                 550                 555                 560

Lys Gly Asn Gln Glu Trp Arg Tyr Asn His Asp Thr Gly Arg Leu Gln
                565                 570                 575

His Ala Val Ser Gln Lys Cys Leu Gly Met Thr Lys Asp Gly Ala Lys
            580                 585                 590

Leu Glu Met Val Ala Cys Gln Tyr Asp Asp Pro Tyr Gln His Trp Lys
        595                 600                 605

Phe Lys Glu Tyr Asn Glu Ala Lys Ala Ile Glu His Gly Ala Lys Pro
    610                 615                 620

Pro Ser
625
```

<210> 28
<211> 618

<212> PRT
<213> Caenorhabditis elegans

<400> 28

```
Met Ile Ala Ser Leu Ile Arg Ser Arg Arg Arg Ser Arg Arg Cys Val
 1               5                  10                  15

Val Tyr Ser Val Phe Leu Phe Gly Phe Leu Ala Leu Trp Gly Ser Phe
            20                  25                  30

Ala Leu Ala Leu Val Phe Leu Ser Asp Met Tyr Ile Gly Glu Asp Gln
        35                  40                  45

Ile Ser Thr Gln Lys Ala Ile Lys Pro Ile Ala Arg Ser Asn Tyr His
    50                  55                  60

Val Val Val Gly His Tyr Asn Gly Asn Leu Pro Glu Asp Lys Lys Arg
65                  70                  75                  80

Asn Leu Thr Ser Glu Glu Leu Asn Ala Asn Leu Tyr Ala Pro His Asp
                85                  90                  95

Asp Trp Gly Glu Gly Gly Ala Gly Val Ser His Leu Thr Pro Glu Gln
            100                 105                 110

Gln Lys Leu Ala Asp Ser Thr Phe Ala Val Asn Gln Phe Asn Leu Leu
        115                 120                 125

Val Ser Asp Gly Ile Ser Val Arg Arg Ser Leu Pro Glu Ile Arg Lys
    130                 135                 140

Pro Ser Cys Arg Asn Met Thr Tyr Pro Asp Asn Leu Pro Thr Thr Ser
145                 150                 155                 160

Val Ile Ile Val Tyr His Asn Glu Ala Tyr Ser Thr Leu Leu Arg Thr
                165                 170                 175

Val Trp Ser Val Ile Asp Arg Ser Pro Lys Glu Leu Leu Lys Glu Ile
            180                 185                 190

Ile Leu Val Asp Asp Phe Ser Asp Arg Glu Phe Leu Arg Tyr Pro Thr
        195                 200                 205

Leu Asp Thr Thr Leu Lys Pro Leu Pro Thr Asp Ile Lys Ile Ile Arg
    210                 215                 220

Ser Lys Glu Arg Val Gly Leu Ile Arg Ala Arg Met Met Gly Ala Gln
225                 230                 235                 240
```

Glu Ala Gln Gly Asp Val Leu Thr Phe Leu Asp Ser His Cys Glu Cys
245 250 255

Thr Lys Gly Trp Leu Glu Pro Leu Leu Thr Arg Ile Lys Leu Asn Arg
260 265 270

Lys Ala Val Pro Cys Pro Val Ile Asp Ile Ile Asn Asp Asn Thr Phe
275 280 285

Gln Tyr Gln Lys Gly Ile Glu Met Phe Arg Gly Gly Phe Asn Trp Asn
290 295 300

Leu Gln Phe Arg Trp Tyr Gly Met Pro Thr Ala Met Ala Lys Gln His
305 310 315 320

Leu Leu Asp Pro Thr Gly Pro Ile Glu Ser Pro Thr Met Ala Gly Gly
325 330 335

Leu Phe Ser Ile Asn Arg Asn Tyr Phe Glu Glu Leu Gly Glu Tyr Asp
340 345 350

Pro Gly Met Asp Ile Trp Gly Gly Glu Asn Leu Glu Met Ser Phe Arg
355 360 365

Ile Trp Gln Cys Gly Gly Arg Val Glu Ile Leu Pro Cys Ser His Val
370 375 380

Gly His Val Phe Arg Lys Ser Ser Pro His Asp Phe Pro Gly Lys Ser
385 390 395 400

Ser Gly Lys Val Leu Asn Thr Asn Leu Leu Arg Val Ala Glu Val Trp
405 410 415

Met Asp Asp Trp Lys His Tyr Phe Tyr Lys Ile Ala Pro Gln Ala His
420 425 430

Arg Met Arg Ser Ser Ile Asp Val Ser Glu Arg Val Glu Leu Arg Lys
435 440 445

Lys Leu Asn Cys Lys Ser Phe Lys Trp Tyr Leu Gln Asn Val Phe Gln
450 455 460

Asp His Phe Leu Pro Thr Pro Leu Asp Arg Phe Gly Arg Met Thr Ser
465 470 475 480

Ser Ser Asn Ser Ser Val Cys Leu Ala Trp Thr Leu Arg Ser Ser Gly
485 490 495

```
Ile Lys Thr Ala Ser Thr Ala Asp Cys Leu Lys Ile Phe His Lys Thr
            500                 505                 510

Gln Leu Trp Leu Tyr Thr Gly Asp Arg Arg Ile Arg Thr Asp Glu His
        515                 520                 525

Leu Cys Leu Ser Val Val Gln Leu Leu His Thr Thr Ser Asp Trp Lys
    530                 535                 540

Ile Gln Leu Lys Glu Cys Ala Gly Phe Asp Thr Glu Tyr Trp Asp Phe
545                 550                 555                 560

Lys Pro Lys Ile Gly Arg Phe Gln Asn Arg Lys Thr Gly Leu Cys Leu
                565                 570                 575

Ala Ser Pro Asp Ile Phe Asp Pro Thr Lys Asp Glu Phe Asn Pro Pro
            580                 585                 590

Ile Val Gln Lys Cys Arg Ser Ser Asn Asp Arg Gln Asn Trp Thr Ile
        595                 600                 605

Thr Glu Met Ser Trp Leu Pro Glu His Pro
    610                 615
```

<210> 29
<211> 579
<212> PRT
<213> Caenorhabditis elegans

<400> 29

```
Met Leu Arg Tyr Ile Ile Pro Arg Lys Lys Gly Thr Phe Val Ile Ala
  1               5                  10                  15

Ala Phe Leu Thr Val Ala Phe Phe Cys Ile Val Ala Tyr His Arg Asn
             20                  25                  30

Asp Arg Arg Arg Thr Lys Phe Gln Phe Pro Asp Ile Glu Lys Tyr Ala
         35                  40                  45

Glu Glu Leu Val Arg Leu Pro Glu Thr Trp Asn Gly Glu Leu His Gln
     50                  55                  60

Ile Pro Asn Tyr Thr Ala Pro Arg Glu Gly Pro Gly Glu Lys Gly Lys
 65                  70                  75                  80

Pro Val Val Leu Thr Gly Lys Asp Ala Glu Leu Gly Gln Ala Asp Met
```

85 90 95

Lys Lys Trp Phe Met Asn Val His Ala Ser Asp Lys Ile Ser Leu Asp
100 105 110

Arg Asp Val Pro Asp Pro Arg Ile Gln Ala Cys Lys Asp Ile Lys Tyr
115 120 125

Asp Tyr Ala Ala Leu Pro Lys Thr Ser Val Ile Ile Ile Phe Thr Asp
130 135 140

Glu Ala Trp Thr Pro Leu Leu Arg Thr Val His Ser Val Ile Asn Arg
145 150 155 160

Ser Pro Pro Glu Leu Leu Gln Glu Val Ile Leu Leu Asp Asp Asn Ser
165 170 175

Lys Arg Gln Glu Leu Gln Glu Pro Leu Asp Glu His Ile Lys Arg Phe
180 185 190

Gly Gly Lys Val Arg Leu Ile Arg Lys His Asp Arg His Gly Leu Ile
195 200 205

Arg Ala Lys Leu Ala Gly Ala Arg Glu Ala Val Gly Asp Ile Ile Val
210 215 220

Phe Leu Asp Ser His Cys Glu Ala Asn His Gly Trp Leu Glu Pro Ile
225 230 235 240

Val Gln Arg Ile Ser Asp Glu Arg Thr Ala Ile Val Cys Pro Met Ile
245 250 255

Asp Ser Ile Ser Asp Asn Thr Leu Ala Tyr His Gly Asp Trp Ser Leu
260 265 270

Ser Thr Gly Gly Phe Ser Trp Ala Leu His Phe Thr Trp Glu Gly Leu
275 280 285

Ser Glu Glu Glu Gln Lys Arg Arg Thr Lys Pro Thr Asp Tyr Ile Arg
290 295 300

Ser Pro Thr Met Ala Gly Gly Leu Leu Ala Ala Asn Arg Glu Tyr Phe
305 310 315 320

Phe Glu Val Gly Gly Tyr Asp Glu Glu Met Asp Ile Trp Gly Gly Glu
325 330 335

Asn Leu Glu Ile Ser Phe Arg Ala Trp Met Cys Gly Gly Ser Ile Glu

340 345 350

Phe Ile Pro Cys Ser His Val Gly His Ile Phe Arg Ala Gly His Pro
355 360 365

Tyr Asn Met Thr Gly Arg Asn Asn Asn Lys Asp Val His Gly Thr Asn
370 375 380

Ser Lys Arg Leu Ala Glu Val Trp Met Asp Asp Tyr Lys Arg Leu Tyr
385 390 395 400

Tyr Met His Arg Glu Asp Leu Arg Thr Lys Asp Val Gly Asp Leu Thr
405 410 415

Ala Arg His Glu Leu Arg Lys Arg Leu Asn Cys Lys Pro Phe Lys Trp
420 425 430

Phe Leu Asp Asn Ile Ala Lys Gly Lys Phe Ile Met Asp Glu Asp Val
435 440 445

Val Ala Tyr Gly Ala Leu His Thr Val Val Ser Gly Thr Arg Met Cys
450 455 460

Thr Asp Thr Leu Gln Arg Asp Glu Lys Met Ser Gln Leu Leu Gly Val
465 470 475 480

Phe His Cys Gln Gly Lys Gly Ser Ser Pro Gln Leu Met Ser Leu Ser
485 490 495

Lys Glu Gly Asn Leu Arg Arg Glu Asn Thr Cys Ala Ser Glu Glu Asn
500 505 510

Gly Asn Ile Arg Met Lys Thr Cys Ser Lys Lys Ala Gln Phe Asn Glu
515 520 525

Arg Trp Ala Tyr Glu Asn Lys Met Ile Arg Asn Leu Lys Ser Gly Lys
530 535 540

Cys Met Ser Thr Ala Asn Leu Lys Pro Gly Asp Asn Ala Ile Val Val
545 550 555 560

Glu Cys Asp Glu Lys Asp Glu His Gln Lys Trp Asn Phe Ile Asp Pro
565 570 575

Ala Lys Ala